

THE QUANTUM MATHEMATICIAN— Satyendra Nath Bose (1894–1974)

YOU PROBABLY KNOW ALBERT EINSTEIN. BUT HAVE YOU HEARD OF HIS INDIAN COLLEAGUE, SATYENDRA NATH BOSE? THEIR COLLABORATIONS CHANGED OUR FUNDAMENTAL UNDERSTANDING OF MATTER AND QUANTUM MECHANICS.

GROWING UP IN CALCUTTA, BOSE TURNED HIS BRILLIANT GRASP OF MATH AND PHYSICS INTO A SERIES OF INNOVATIONS. HE EXPLORED THE QUANTUM SCALE: THE TINY SCALE OF SUBATOMIC PARTICLES. SUBATOMIC PARTICLES, LIKE ELECTRONS OR PHOTONS, ARE THE SMALLEST UNITS THAT MAKE UP OUR UNIVERSE. ON THIS SCALE, STRANGE THINGS HAPPEN.



Presidency
College

Established
1817

BIG HISTORY PROJECT

ART BY
KAY SOHINI

Bose is best known for “BOSE-EINSTEIN STATISTICS”. This was a new way of making predictions about how subatomic particles behaved. Bose studied photons, the particles of light that transfer electromagnetic force. In 1924, Bose wrote to Albert Einstein to share his theory.

Einstein extended Bose’s research to the **Bose-Einstein condensate**. This theory showed that when particles get cold enough, they stop behaving like particles, and they start behaving like waves. A particle exists in a specific place. These bits of matter can move and collide with others. But waves are different—they aren’t in a specific place. They wiggle and move through things.

Respected Sir, I have ventured to send you the accompanying article for your perusal and opinion. I am anxious to know what you think of it.



What’s weird is that some subatomic particles can have properties of both particles and waves!

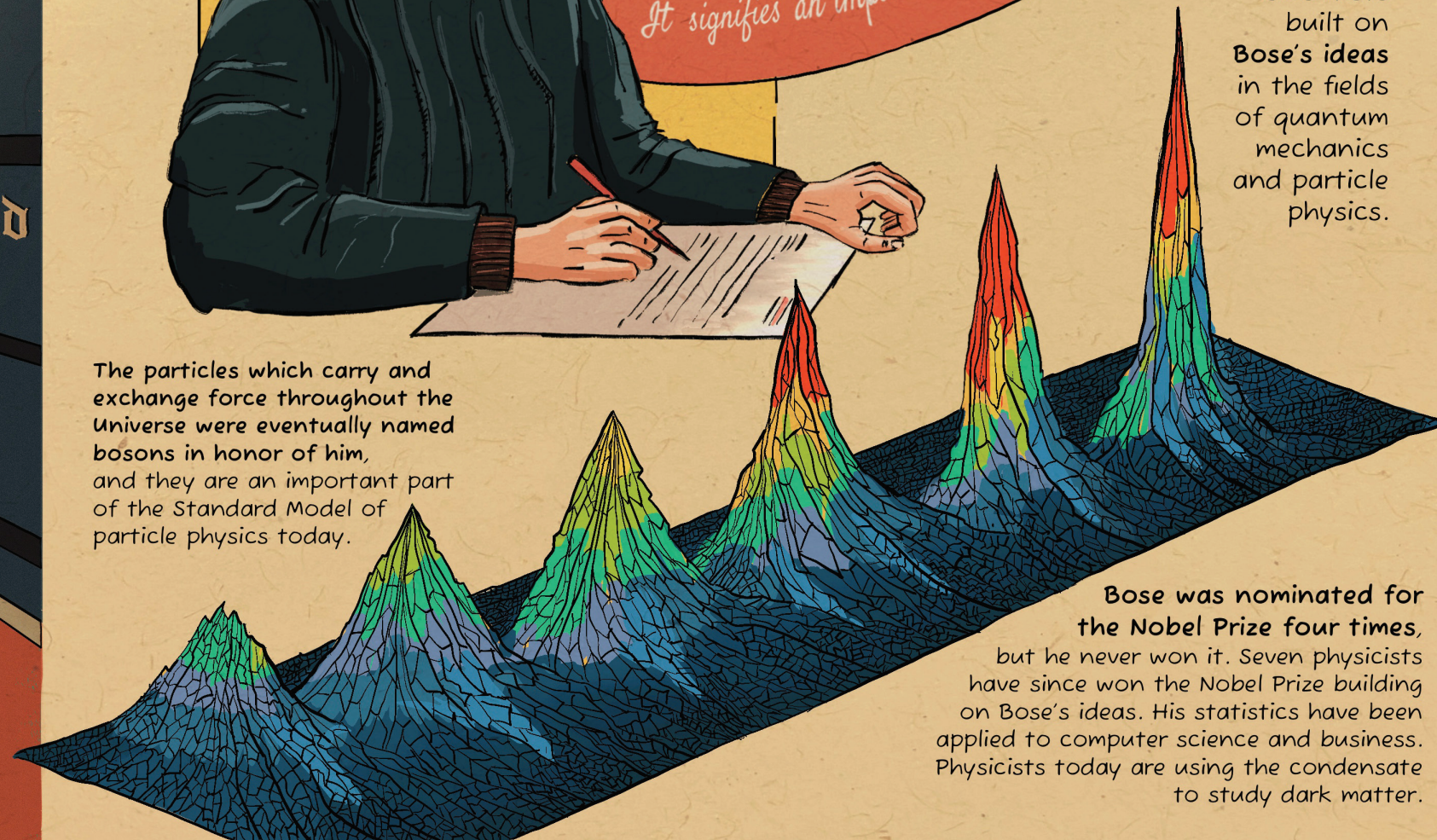
Bose’s work gave us important tools for understanding the behavior of these bizarre subatomic particles.



It signifies an important step forward and pleases me very much...

Many scientists built on Bose’s ideas in the fields of quantum mechanics and particle physics.

The particles which carry and exchange force throughout the Universe were eventually named **bosons** in honor of him, and they are an important part of the Standard Model of particle physics today.



Bose was nominated for the **Nobel Prize** four times, but he never won it. Seven physicists have since won the Nobel Prize building on Bose’s ideas. His statistics have been applied to computer science and business. Physicists today are using the condensate to study dark matter.